HEIGHT ADJUSTMENT LOCK FOR TABLE LEGS

Filed Aug. 3, 1966

2 Sheets-Sheet 1

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ABSTRACT OF THE DISCLOSURE

A pair of tubular legs are connected by a hollow stretcher in which are retractable dogs which interlock with extension legs telescopically reciprocable within the legs connected by the stretcher. The extension legs are preferably interconnected at their lower ends by a base or foot. While the exemplification illustrated has a pair of legs hingedly connected with the table top, it is immaterial to the height adjustment whether the legs are thus pivoted.

The invention is particularly concerned with the means for actuating the dogs. The leg elements connected by the stretcher have openings through which the respective dogs are spring biased into engagement with the telescopically adjustable leg extensions. The latter not only have apertures to receive the dogs but are so designed as to interact with the downwardly beveled ends of the dogs to cam the dogs aside when the legs are being raised. At any level at which openings in the extensions are provided, the dogs will be projected into such openings by their biasing springs housed within the stretcher. Against downward movement of the table, the dogs interact with the extensions to provide secure support. It is therefore necessary to provide means for positively retracting the dogs when downward adjustment of the table is desired.

Intermediate the legs, the stretcher is provided with a vertically reciprocable slide for which the stretcher provides guides. The lower margin of the slide extends below the stretcher and constitutes a handle for the raising of the slide. The slide provides camming surfaces which are preferably made by cutting openings in the slide having oblique margins engaged by cam follower rollers on the respective dogs. Thus when the slide is raised with respect to the stretcher, the dogs are retracted against the bias of their respective springs to permit the top and legs to be lowered to the desired level.

It is preferred that camming action be effected by the raising rather than the lowering of the slide because the operator is thereby enabled to provide support for the stretcher at the end of the table where the adjustment is being effected.

Background of the invention

Hoven, 2,805,906; Fox, 2,875,007; White, 2,547,296; and Cleveland, 872,498 are examples of prior art devices for table height adjustment.

Description of the invention

In the drawings:

FIG. 1 is a view in perspective of a table embodying my invention.

FIG. 2 is an enlarged fragmentary detail view in perspective showing details of the connection holding a pair of legs to the table top, the table top being broken away.

FIG. 3 is a further enlarged detail view fragmentarily illustrating in end elevation portions of the pair of legs and extensions, with portions of the stretcher and one of the legs being broken away.

FIG. 4 is a fragmentary view illustrating some of the parts shown in FIG. 3 but in different respective positions.

FIG. 5 is a further enlarged view taken in section on the line 5—5 of FIG. 3.

FIG. 6 is an enlarged view taken in section on the line 6—6 of FIG. 3.

FIG. 7 is an enlarged view taken on the line 7—7 of FIG. 3.

The invention is not particularly concerned with the table top or its frame 10, if any, or with the details of the preferred hinged connection between the table top and the pair of legs provided with the extensions herein described. In the device illustrated, the tubular legs 12 and 14 are connected at their upper ends with a transverse pipe 16 rotatable in the brackets 18 attached to the under side of the table top 8. Rotation of the pipe 16 in the brackets permits the legs to be folded against the lower surface of the table top. To hold the legs erect when they are lowered to position of use, brake means is preferably provided and generally designated by reference character 20. A fitting 22 is secured to the table top.

To this are pivoted at 24 the parallel legs 26 of a U-shaped brace member 28. Near its bight the bridge member 28 has pivotal connection at 30 with bracing arms 32 which extend laterally and downwardly to pivotal connection at 34 with the legs 12 and 14.

The leg extensions 36 and 38 are telescopically adjustable in the legs 12 and 14, respectively, and are preferably connected at their bottoms by a base or foot member 40.

Traversely connecting the pair of legs 12 and 14 near their lower ends is a stretcher generally designated by reference character 42 as shown in detail in FIGS. 3 to 7. The stretcher is hollow and contains lock parts for retractably positioning the extensions 12 and 14 in adjustment with respect to legs 12 and 14.

Conveniently the stretcher comprises a pair of stampings 44 and 46, one of which (stamping 44) may be secured to the pair of legs 12 and 14 by welds at 48. Stamping 46 is maintained in assembly with stamping 44 and with the pair of legs 12 and 14 by means of shoulder rivets 50 which also perform the function of guiding reciprocable dogs which lock the extension in adjustment. The portions 52 and 54 of the stampings 44 and 46 which are connected by the shoulder rivets 50 are held in relatively close proximity to provide lateral guidance for the reciprocable dogs 56 and 58 (FIGS. 5 and 7). Support and guidance in a vertical plane are provided by the shoulder rivets 50 for which the dogs have elongated slots 60. Thus supported and guided, the dogs are reciprocable between an advanced position as shown in FIG. 3 and FIG. 5 and the retracted position in which the dog 56 is illustrated in FIG. 4. The dogs are biased toward their advanced positions by tension springs 62 having anchorages 64 on stamping 46 and connected at their other ends in holes 66 provided in the respective dogs.

Each of the legs connected by the stretcher is provided with a slot 68 through which the reduced and beveled extremity 70 of the respective dog extends when the dog is in its advanced position. In said position, the extremity 70 of the dog engages in the opening 72 in the respective leg extension as shown in FIG. 3 and FIG. 5.

It will be observed in FIG. 5 that the portion 74 of the leg extension 38 in which the dog-receiving aperture 72 is formed has been embossed inwardly to provide a camming surface with which the beveled end 70 of the respective dog will react when relative upward movement of the table top and pair of legs 12 and 14 respecting the
extension legs 36 and 38 causes the beveled upper margin 76 of the dog terminal 70 to pass readily from one hole 72 to the next so that no manual retraction of the dogs is required in this direction of relative movement. On the other hand, the lower margins 78 of the respective dogs are horizontal and remain seated on the margins of the aperture 72 of the respective extension legs against any downward pressure which they are capable of withstanding. They can be released for downward adjustment only by manually retracting them in the manner presently to be described.

As best shown in FIG. 6, the front stamping 44 of stretcher 42 is centrally embossed to provide a bearing surface 80 for a vertically reciprocable slide 82 held to said surface, and reciprocally guided, by shoulder rivets 84, which are vertically spaced and for which the slide has an elongated slot 86. The lower end portion 88 of this slide projects through the bottom slot 90 in the stretcher 42 and is provided at 92 with a handle flange for manipulation of the slide in an upward direction with regard to the stretcher. Means is provided whereby the upward movement of the slide 82 exerts camming pressure upon the respective dogs 56, 58 to retract them from engagement of their ends 70 in the respective extension legs. The dogs are respectively provided with cam follower rollers 94. Slide 82 has cam surfaces 96 cooperating with such rollers. A preferred arrangement shown in the drawings (FIGS. 3, 4 and 5) is such that the cam surfaces 96 comprise the hypotenuse side margins of triangular openings 98 in the slide 82.

FIG. 3 shows the parts in the normal locking position of the dogs, the respective cam follower rollers being at the upper ends of the cam margins 96 with which they interact. When the slide 82 is raised, as by upward pressure upon the handle portion 92, the converging downward inclination of the respective cam surfaces 96 draws the cam follower roller 94 and the respective dog toward each other as shown in FIG. 4, thus retracting the ends 70 of the dogs from locking engagement with corresponding openings in the legs extension 36, 38.

One advantage of having the slide movable in the direction of the arrow 100 to achieve retraction of the dogs is to facilitate operation and support of the table with a single hand of the operator. Retraction of the dogs from locking engagement with the leg extension obviously leaves one end of the table completely unsupported so far as the leg extensions are concerned. By the disclosed arrangement, slide vertical operator is able with one hand to retract the dogs and at the same time to sustain the weight of the otherwise unsupported end of the table while lowering the table to the desired new position of adjustment.

For raising the table, no manipulation of the slide is required. Due to the camming interaction of the end portion 70 of the dog with the inwardly embossed surfaces 74 of the leg extensions, it is only necessary for the operator to step on the bar 40 and to lift the table top. His weight holds the leg extensions in position while the dogs ratchet from one opening 72 to another until the desired height is reached. The triangular openings in the actuating slide provide clearance for movement of the rollers when the dogs are thus displaced by camming interaction with the leg extensions. Thus the means for positive dog retraction by manual operation of the slide does not preclude free independent movement of the dogs during the table raising operation.

What is claimed is:

1. An adjustable table leg structure including a pair of tubular legs, extensions telescopically reciprocable with respect to said legs and having locking apertures, a dog engageable in the locking apertures of each extension, a hollow stretcher connecting the said legs and comprising complementary stampings having connecting shoulder-rivets, the said dogs having slots engaged on said rivets and supporting and guiding the dogs for lateral reciprocation between retracted positions in which the dogs are withdrawn from the respective extensions and advanced positions in which the dogs are engaged in the apertures of the respective extensions, and means for concurrently retracting the dogs and comprising a cam slide vertically movable between said legs, said slide having apertures through which certain of the rivets extend and having inclined margins bounding said apertures and constituting cam surfaces with which the respective dogs have cam followers normally engaged, the slide being guided by the shoulder rivets for vertical movement and said margins being inclined to retract the dogs in response to an upward vertical movement of the cam extensions.

2. A structure according to claim 1 in which the stretcher is provided internally with separate springs anchored to the stretcher and connected with the respective dogs for biasing the dogs toward their advanced positions, the cam followers and cam surfaces of said slide acting in a direction to retract the respective dogs against the bias of their respective springs.

3. A structure according to claim 1 in which the respective dogs have terminal portions provided with substantially horizontal lower margins, and with beveled upper margins, the said terminal portions being receivable into the apertures of the leg extensions.

4. A combination according to claim 3 in which the leg extensions are tubular and have integral wall portions inwardly embossed and providing unbroken continuous cam surfaces adjacent the respective openings therein, said surfaces coating with the beveled upper margins of the terminal portions of the dogs for camming the dogs inwardly to permit manual upward movement of the legs and the dogs with respect to the leg extensions.

5. An adjustable table leg structure including a pair of tubular legs, extensions telescopically reciprocable with respect to said legs and having locking apertures, a dog having a beveled and retractably engageable in the locking apertures of each said extension, a hollow stretcher extending transversely between said legs and connected therewith and provided internally with means for supporting and guiding the dogs for lateral reciprocation between retracted positions in which the dogs are withdrawn from the apertures of the respective extensions and advanced positions in which the dogs are engaged in the apertures of said extensions, and means for concurrently retracting the dogs and comprising a cam slide vertically movable with respect to the stretcher, means for guiding the slide for vertical movement, and cam follower means on the respective dogs engaged with cam surfaces with which the slide is provided, said slide having openings with inclined margins bounding the openings and constituting the said cam surfaces, the openings being sufficiently large to provide clearance for said followers to accommodate independent movement of the dogs to permit free in-and-out movement of the dogs independently of the slide as the beveled ends of the dog ratchet with respect to the locking apertures when the table legs and stretcher are being elevated with regard to said extensions.

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